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Foraging observations of the threatened Long-billed Tailorbird *Artisornis moreaui* in Tanzania

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The Long-billed Tailorbird *Artisornis moreaui* is a critically endangered warbler with an highly disjunct distribution. It is known from forest and forest edge at two locations 950 km apart—subspecies *moreaui* of the East Usambara Mountains of northeast Tanzania and subspecies *sousae* at Serra Jeci (Njesi Plateau) in northern Mozambique (Irwin 1997). Cordeiro *et al.* (2001) estimated the East Usambara Long-billed Tailorbird population size as 150–200 individuals in June 2000. After a 57-year gap in ornithological surveys, Ryan & Spottiswoode (2003) recently confirmed that the Mozambique population has survived the country's civil war. Their report of a pair of Long-billed Tailorbirds in the forest canopy at Serra Jeci corroborates the previously debated descriptions of habitat use made by the collector Jali Makawa (Benson 1945, 1946). This anecdotal information for the *sousae* subspecies contrasts with most descriptions of habitat use in the nominate East Usambara subspecies *moreaui*, which is frequently described as an understorey resident (Stuart 1981, Collar & Stuart 1985, Collar *et al.* 1994, Irwin 1997). In 2001, we collected data on foraging behaviour over two weeks at Amani Nature Reserve in Tanzania's East Usambara Mountains. These data provide insight into *moreaui's* typical foraging heights, foraging substrate and foraging style.

Study area and methods

The Amani Nature Reserve (04°S, 38°E), gazetted in 1997, is located within the East Usambara Mountains, northeast Tanzania. It comprises 8380 ha of near-continuous submontane and lowland rain forest, broken up in some areas by roads and agriculture. Schulman *et al.* (1998) describe this site in detail.

We observed the foraging behaviour of Long-billed Tailorbirds between 18 and 30 April 2001. On the Amani plateau, pairs are territorial, making it possible to repeat observations of specific pairs on different days. Therefore, for each day of observation, we targeted one of five potential territories where birds had previously been seen. To assess foraging style we recorded the types of manoeuvre made following Remsen & Robinson (1990). We

recorded foraging substrates in two ways: (i) the substrate on which the bird attacked (live leaf, dead leaf, branch) and (ii) the general vegetation type of that substrate (vine tangle, tree, shrub) when possible. The vegetation was too dense at some higher up foraging attack sites to distinguish between plants. Prey type was rarely observed. We also measured or estimated the height of each foraging attack.

Results

We recorded 56 foraging manoeuvres made by 8–11 individuals at four out of five sites during nine days of observations. Three of the four sites were roadside territories at the forest edge, while the fourth was a wet glade in the interior of the forest.

Foraging heights varied from 0.5 m to 24 m with a median of 3.9 m (n = 56, Figure 1). 85.7 % of foraging manoeuvres were gleans and most foraging attacks (71.4 %) occurred on live leaves (Table 1), most frequently on the underside of the leaves. We were able to categorise the vegetation type of 51 foraging manoeuvres with 86.3 % of these occurring in vine tangles. The only exceptions were four foraging attacks in *Lantana* shrubs, two in a small exotic bamboo (*Bambusa* sp.), and one on a tree leaf immediately adjacent to a vine tangle.

Discussion

We argue that descriptions of *moreaui* as an understorey resident (Stuart 1981, Collar & Stuart 1985, Collar *et al.* 1994, Irwin 1997) of East Usambara forests require some modification as they have led to the perception that this subspecies will not forage in the canopy. Irwin (1997) states that this bird "feeds no higher than 10 m". Furthermore, the term 'understorey' itself causes confusion, as the height and vegetation types of understorey are frequently not defined. For the purpose of this discussion, we define the East Usambara forest understorey as comprising shrubs, seedlings, saplings, vines and climbers whose foliage is predominantly below the minimum height of the local tree canopy (from 0 to between 5 and 10 m). Vines typically reach well above these heights and into the canopy at Amani Nature Reserve, especially at forest edges and in natural or man-made forest

Table 1. Attack manoeuvre types, substrate and vegetation classifications for Long-billed Tailorbird *Artisornis moreaui moreaui* foraging attacks.

Attack manoeuvres (n = 56)					
Glean	Reach-out glean	Reach-up glean	Reach-down glean	Probe	Lunge
28	8	9	3	2	6

Substrate (n = 56)		
Live leaf	Branch	Dead leaf
42	9	5

Vegetation type (n = 51)			
Vine	*Lantana camara*	Exotic bamboo (*Bambusa* sp.)	Tree
44	4	2	1

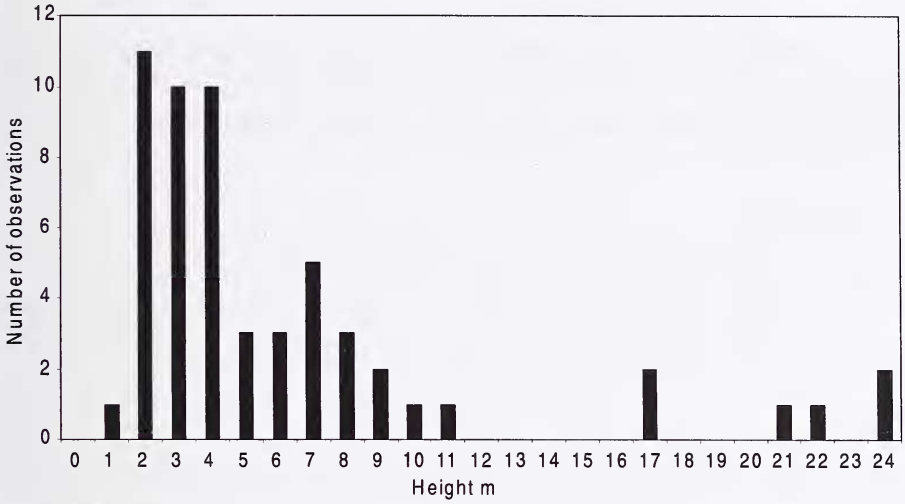

Figure 1. Distribution of foraging attack heights from 56 observations of 8 to 11 individuals of Long-billed Tailorbird *Artisornis moreaui moreaui* (median = 3.9 m).

gaps. We observed *moreaui* foraging at heights up to 24 m in vine tangles, not only as a result of following tangles upwards from the understorey but also by flying directly across forest clearings at these heights. Based upon these observations, it is clear that the *moreaui* subspecies utilises micro-habitats rich in vines irrespective of height.

The median height of our foraging observations (3.9 m) is considered understorey according to our definition, and certainly individuals spent much of their time low in the vegetation where vines were present. We believe, however, that further observations of this subspecies along forest edges and in natural forest clearings will reveal much more activity in the mid- to upper-forest canopy. Ryan & Spottiswoode (2002) suggested a difference in habitat use between the two subspecies of Long-billed Tailorbird based on old sightings of *sousae* in the canopy (Benson 1945, 1946) and their own recent observations of a pair in the canopy at Serra Jeci. However, comparisons of habitat use between the two subspecies are likely to be a more complex issue than a simple understorey–canopy dichotomy. The East Usambara and Serra Jeci forests undoubtedly differ in vegetation structure, so direct comparisons on habitat use between the two locations are difficult to make. Cordeiro *et al.* (2001) alluded to this problem in noting that the canopy heights at the two locations are disparate. Additionally, evidence of habitat use for *sousae* is particularly scant.

A second debatable perception of *moreaui* habitat use is that it prefers forest edge to interior forest. While the birds occupy the forest edge in many areas around Amani Nature Reserve, they are also present in interior forest openings. MPJ and NJC have discovered *moreaui* at 13 locations in forest glades deep in the forest interior. In this study, we observed 17 foraging manoeuvres in a large interior forest wetland glade, habitat similar to forest edge in its preponderance of vines. Indeed, within this forest glade, all

foraging manoeuvres observed were gleans off vine leaves. Thus, while our data do not allow us to formally assess habitat preferences, it does support suggestions that the Long-billed Tailorbird depends in part on light gaps or edges (Sclater & Moreau 1931, Stuart 1981), where vines and climbers are most prevalent.

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